

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

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PCT

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

(PCT Rule 43bis.1)

Date of mailing
(day/month/year) **30 NOVEMBER 2004 (30.11.2004)**

Applicant's or agent's file reference

P11871-PCT

FOR FURTHER ACTION

See paragraph 2 below

International application No.

PCT/KR2004/002630

International filing date (day/month/year)

14 OCTOBER 2004 (14.10.2004)

Priority date(day/month/year)

14 OCTOBER 2003 (14.10.2003)

International Patent Classification (IPC) or both national classification and IPC

IPC7 H03M 13/11

Applicant

SAMSUNG ELECTRONICS CO., LTD. et al

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.
For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/KR



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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/KR2004/002630

Box No. 1 Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This opinion has been established on the basis of a translation from the original language into the following language _____, which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material
☐ a sequence listing
☐ table(s) related to the sequence listing
 - b. format of material
☐ in written format
☐ in computer readable form
 - c. time of filing/furnishing
☐ contained in the international application as filed.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/KR2004/002630

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

| | | | |
|-------------------------------|--------|-----|-----|
| Novelty (N) | Claims | 1-9 | YES |
| | Claims | | NO |
| Inventive step (IS) | Claims | 1-9 | YES |
| | Claims | | NO |
| Industrial applicability (IA) | Claims | 1-9 | YES |
| | Claims | | NO |

2. Citations and explanations :

The following documents are referred to;

D1 KR 2003-0036227

D2 US 2002/0042899 A1

D1 and D2 disclose systems and methods for LDPC coded modulation. By substituting low density parity check coding in place of the convolution code as part of a combined modulation and encoding procedure, low density parity check coding and modulation can be performed. The low density parity check codes have no error floor, no cycles, an equal bit error rate for the information bits and the parity bits, and timely construction of both a parity check matrix with variable code word size and a generator matrix is possible.

The present claims 1-9 also disclose an apparatus and method for encoding low density parity check codes. The method for generating a low density parity check code formed of an information matrix and a parity matrix comprises the steps of converting the information matrix into an array code structure and assigning a degree sequence to each submatrix into an array code structure and assigning a degree sequence to each submatrix column extending a dual diagonal matrix corresponding to the parity matrix such that the offset value between diagonals has random value; lifting the normalized dual diagonal matrix; determining an offset value for cyclic column shift for each submatrix of the lifted-normalized dual diagonal matrix; and determining a parity symbol corresponding to a column of the parity matrix. Thus the subject matter of present claims 1-9 is considered not to be able to be rendered obviously from the prior arts.

Therefor the subject matter of present claims 1 to 9 differs from the prior arts, and this teaching is not rendered obviously from the prior arts or from combining the two of the prior arts.

Thus the novelty of the subject matter claimed can be acknowledged, and also the subject matter of the claim 1 to 9 appears to involve an intensive step in the sense of ART 33(3)PCT as well.